Space Weather Forecast

Issued on Saturday 26 October 2024 at 13:02 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares likely, slight chance of further Strong flares. Chance of G1-G2/Minor-Moderate geomagnetic storm intervals day 1 (26 Oct).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity had been Low for much of the past 24 hours but became High following a recent Strong flare from the southeast of the disk. This flare beginning shortly before 26/0600 UTC.

There are currently twelve sunspot regions on the disc. The main focus is a cluster in the southeast of the disc, with three significant regions located here. They all maintain fairly complex appearances and magnetic configurations. Most other regions on the disc are smaller but multiple regions showing gradual development and a general increase in sunspot activity. New minor regions were numbered in the southwest and southeast during the period.

Assessment and modeling ongoing into the large CME (Coronal Mass Ejection) associated with the recent Strong flare for any potential Earth directed component.

Solar Wind / Geomagnetic Activity: Solar winds were at Slow-ambient speeds, generally varying between 310-340km/s. The Interplanetary Magnetic Field (IMF), Bt, remained Weak for much of the period, but showed a sharp increase to a Moderate peak from 26/1134 UTC and has remained at Moderate levels to end the period. The important north-south component, Bz, was generally Weak throughout, though became Moderately positive following the peak in Bt. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) was below alert levels with no Solar Radiation Storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Generally Moderate activity is expected, with occasional Moderate-class flares considered likely and a slight chance of Strong-class flares, most probable from the numerous active regions in the southeast disc.

Solar Wind / Geomagnetic Activity:

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A CME resulting from the Strong flare of a sunspot in the southeast disc on 24 Oct has been remodelled as a potential glancing impact at Earth on day 1 (26 Oct), perhaps recently observed. This may combine with one or more weak CMEs that left the Sun on 22/23 Oct which have a small chance of a glancing impact, also on day 1 (26 Oct).

Solar winds are currently at Background levels but may become Slightly Elevated to Elevated during day 1 into day 2 (26-27 Oct) with potential fast wind and glancing CME influence. A return to mainly Background winds is currently expected into days 3 and 4 (28 and 29 Oct).

Activity is expected to be generally Quiet to Active on day 1 (26 Oct) with a chance of peak G1/Minor to G2/Moderate Storm conditions should geomagnetic conditions be favourable following any CME arrival. Activity should be Quiet to Active on day 2 (27 Oct), with perhaps a slight chance of G1/Minor Storm conditions at first. From day 3 (28 Oct) onward activity should return to Quiet to Unsettled levels.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist generally at Background with no Solar Radiation Storms expected.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	30	10	5	5
Strong	**G3**	No	5	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	Yes	70	70	70	70
Very Active	**R3-R5 (X Class)**	Yes	20	20	20	20

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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